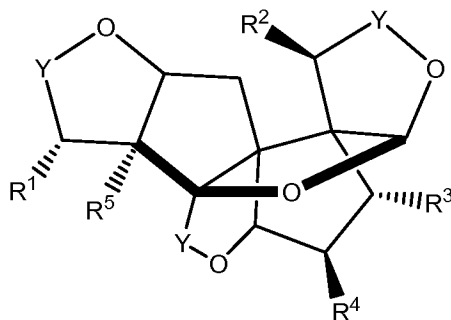


AMENDMENTS TO THE CLAIMS

1. (Original): A compound having the formula:



(I)

or a pharmaceutically acceptable salt thereof,

wherein:

each occurrence of Y is independently $-\text{CH}_2-$ or $-\text{C}(\text{O})-$;

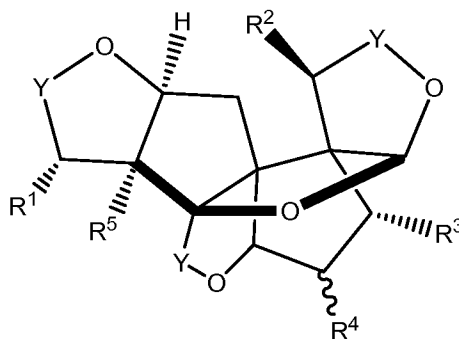
R^1 and R^3 are each independently $-\text{H}$ or $-\text{C}_1\text{-C}_6$ alkyl;

R^2 is $-\text{H}$, $-\text{OH}$, $-\text{O-C}_1\text{-C}_5$ alkyl, $-\text{O-C}_2\text{-C}_5$ alkenyl, $-\text{O-C}_2\text{-C}_5$ alkynyl, $-\text{O-C}(\text{O})\text{-C}_1\text{-C}_5$ alkyl, $-\text{O-C}(\text{O})\text{-aryl}$, $-\text{O-CO-NH-C}_1\text{-C}_5$ alkyl, $-\text{O-SO}_2\text{-C}_1\text{-C}_5$ alkyl, or $-\text{O-SO}_2\text{-aryl}$;

R^4 is $-\text{C}_1\text{-C}_5$ alkyl, $-\text{NH}_2$, $-\text{halo}$, $-\text{C}_2\text{-C}_5$ alkenyl, $-\text{C}_2\text{-C}_5$ alkynyl, $-\text{O-C}_1\text{-C}_5$ alkyl, $-\text{O-C}_2\text{-C}_5$ alkenyl, $-\text{O-C}_2\text{-C}_5$ alkynyl, $-\text{O-C}(\text{O})\text{-C}_1\text{-C}_5$ alkyl, $-\text{O-C}(\text{O})\text{-aryl}$, $-\text{O-CO-NH-C}_1\text{-C}_5$ alkyl, $-\text{O-SO}_2\text{-C}_1\text{-C}_5$ alkyl, or $-\text{O-SO}_2\text{-aryl}$; and

R^5 is $-\text{H}$ or $-\text{OH}$.

2. (Original): A composition consisting essentially of two or more structurally distinct compounds, each having the formula:



(II)

wherein:

each occurrence of Y is independently $-\text{CH}_2-$ or $-\text{C}(\text{O})-$;

R^1 and R^3 are each independently $-\text{H}$ or $-\text{C}_1\text{-C}_6$ alkyl;

R^1 and R^3 are each independently $-\text{H}$ or $-\text{C}_1\text{-C}_6$ alkyl;

R^2 is $-\text{H}$, $-\text{OH}$, $-\text{O-C}_1\text{-C}_5$ alkyl, $-\text{O-C}_2\text{-C}_5$ alkenyl, $-\text{O-C}_2\text{-C}_5$ alkynyl, $-\text{O-C}(\text{O})\text{-C}_1\text{-C}_5$ alkyl, $-\text{O-C}(\text{O})\text{-aryl}$, $-\text{O-CO-NH-C}_1\text{-C}_5$ alkyl, $-\text{O-SO}_2\text{-C}_1\text{-C}_5$ alkyl, or $-\text{O-SO}_2\text{-aryl}$;

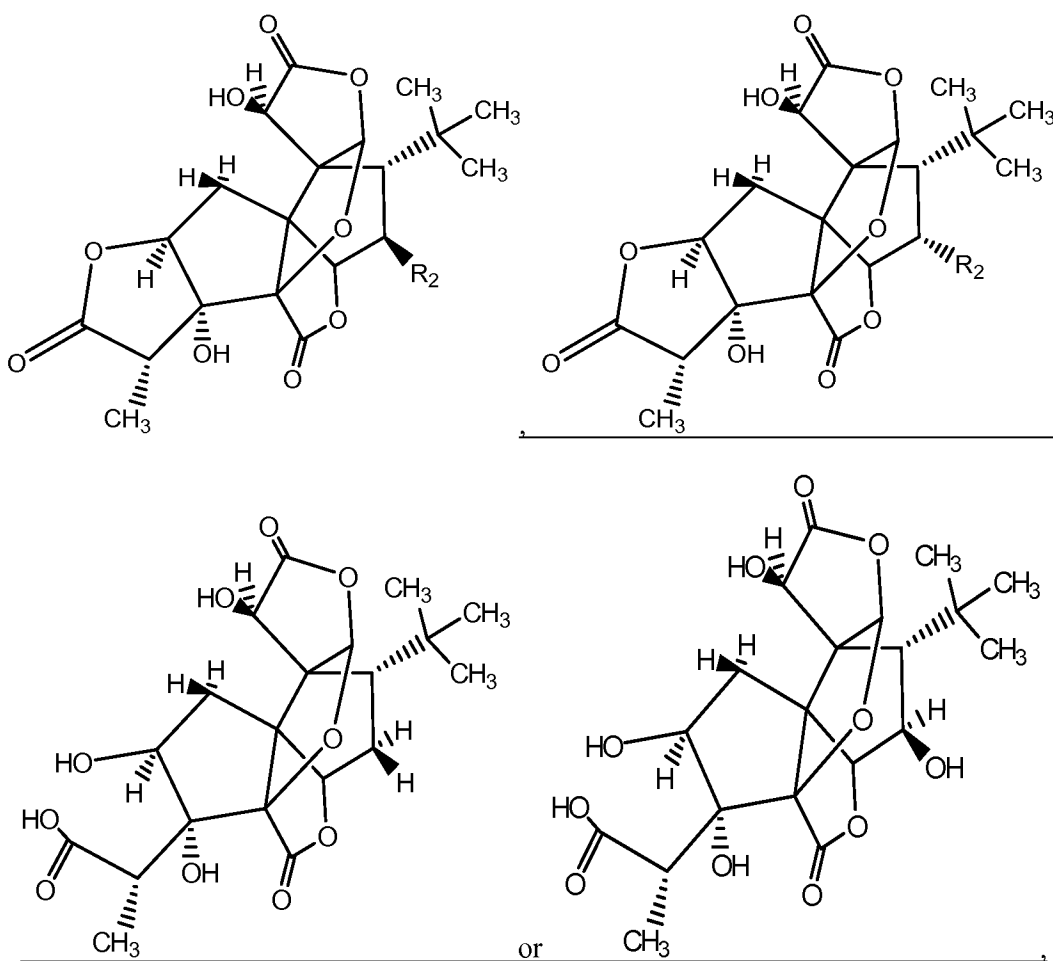
R^4 is $-\text{C}_1\text{-C}_5$ alkyl, $-\text{NH}_2$, $-\text{halo}$, $-\text{C}_2\text{-C}_5$ alkenyl, $-\text{C}_2\text{-C}_5$ alkynyl, $-\text{O-C}_1\text{-C}_5$ alkyl, $-\text{O-C}_2\text{-C}_5$ alkenyl, $-\text{O-C}_2\text{-C}_5$ alkynyl, $-\text{O-C}(\text{O})\text{-C}_1\text{-C}_5$ alkyl, $-\text{O-C}(\text{O})\text{-aryl}$, $-\text{O-CO-NH-C}_1\text{-C}_5$ alkyl, $-\text{O-SO}_2\text{-C}_1\text{-C}_5$ alkyl, or $-\text{O-SO}_2\text{-aryl}$; and

R^5 is $-\text{H}$ or $-\text{OH}$.

3. (Previously Presented): The composition of claim 2, wherein for at least one compound of formula (II), each occurrence of Y is $-\text{CH}_2-$.

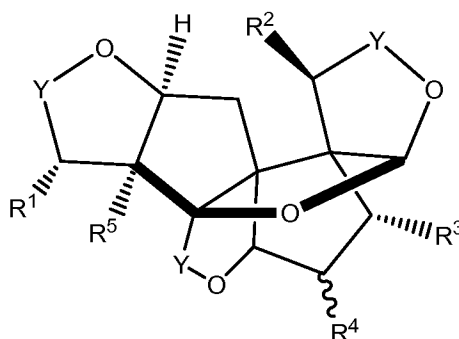
4. (Previously Presented): The composition of claim 2, wherein for at least one compound of formula (II), each occurrence of Y is $-C(O)-$.
5. (Previously Presented): The composition of claim 2, wherein for at least one compound of formula (II), R^1 is $-C_1-C_6$ alkyl.
6. (Original): The composition of claim 5, wherein R^1 is methyl.
7. (Previously Presented): The composition of claim 2, wherein for at least one compound of formula (II), R^3 is $-C_1-C_6$ alkyl.
8. (Original): The composition of claim 7, wherein R^3 is *tert*-butyl.
9. (Previously Presented): The composition of claim 2, wherein for at least one compound of formula (II), R^4 is $-OH$.
10. (Previously Presented): The composition of claim 2, wherein for at least one compound of formula (II), R^5 is $-OH$.
11. (Previously Presented): The composition of claim 2, wherein for at least one compound of formula (II), R^2 is $-OH$.

12. (Currently Amended): A composition consisting essentially of a first compound having the formula:



wherein R_2 is $-H$, $-C_1-C_5$ alkyl, $-OH$, $-NH_2$, $-halo$, $-C_2-C_5$ alkenyl, $-C_2-C_5$ alkynyl, $-O-C_1-C_5$ alkyl, $-O-C_2-C_5$ alkenyl, $-O-C_2-C_5$ alkynyl, $-O-C(O)-C_1-C_5$ alkyl, $-O-C(O)-aryl$, $-O-CO-NH-C_1-C_5$ alkyl, $-O-SO_2-C_1-C_5$ alkyl, or $-O-SO_2-aryl$;

and one or more structurally distinct compounds, each having the formula:



(II)

wherein each occurrence of Y is independently $-\text{CH}_2-$ or $-\text{C}(\text{O})-$;

R¹ and R³ are each independently $-\text{H}$ or $-\text{C}_1-\text{C}_6$ alkyl;

R¹ and R³ are each independently $-\text{H}$ or $-\text{C}_1-\text{C}_6$ alkyl;

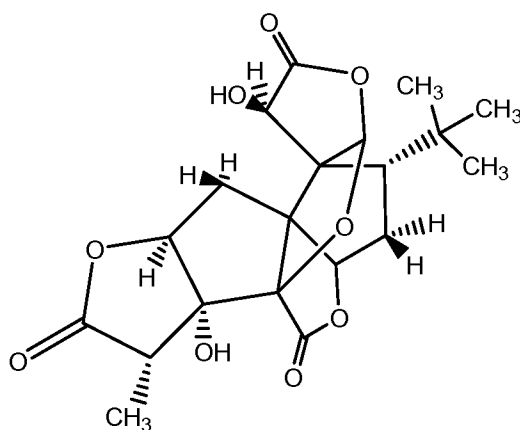
R² is $-\text{H}$, $-\text{OH}$, $-\text{O}-\text{C}_1-\text{C}_5$ alkyl, $-\text{O}-\text{C}_2-\text{C}_5$ alkenyl, $-\text{O}-\text{C}_2-\text{C}_5$ alkynyl, $-\text{O}-\text{C}(\text{O})-\text{C}_1-\text{C}_5$ alkyl, $-\text{O}-\text{C}(\text{O})-\text{aryl}$, $-\text{O}-\text{CO}-\text{NH}-\text{C}_1-\text{C}_5$ alkyl, $-\text{O}-\text{SO}_2-\text{C}_1-\text{C}_5$ alkyl, or $-\text{O}-\text{SO}_2-\text{aryl}$;

R⁴ is $-\text{C}_1-\text{C}_5$ alkyl, $-\text{NH}_2$, $-\text{halo}$, $-\text{C}_2-\text{C}_5$ alkenyl, $-\text{C}_2-\text{C}_5$ alkynyl, $-\text{O}-\text{C}_1-\text{C}_5$ alkyl, $-\text{O}-\text{C}_2-\text{C}_5$ alkenyl, $-\text{O}-\text{C}_2-\text{C}_5$ alkynyl, $-\text{O}-\text{C}(\text{O})-\text{C}_1-\text{C}_5$ alkyl, $-\text{O}-\text{C}(\text{O})-\text{aryl}$, $-\text{O}-\text{CO}-\text{NH}-\text{C}_1-\text{C}_5$ alkyl, $-\text{O}-\text{SO}_2-\text{C}_1-\text{C}_5$ alkyl, or $-\text{O}-\text{SO}_2-\text{aryl}$; and

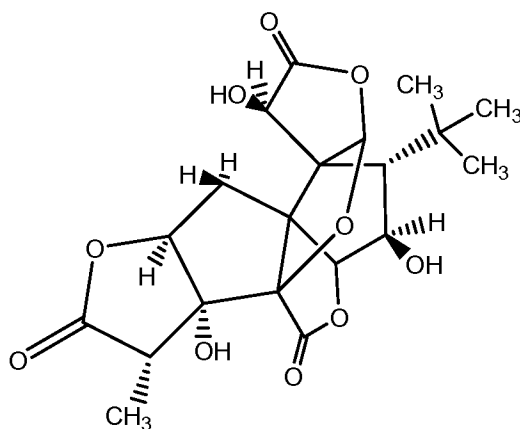
R⁵ is $-\text{H}$ or $-\text{OH}$.

13. (Canceled).

14. (Previously Presented): The composition of claim 12, wherein the first compound is a compound having the formula:



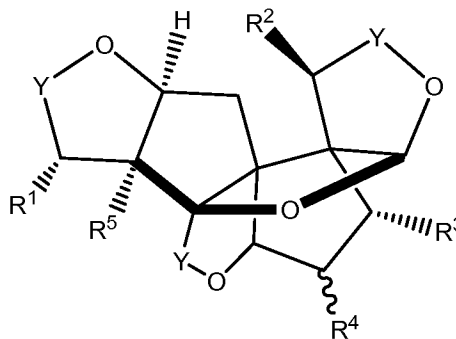
15. (Previously Presented): The composition of claim 12, wherein the first compound is a compound having the formula:



16-17. (Canceled)

18. (Currently Amended): ~~The~~ A composition of ~~claim 2, wherein the composition consists~~ consisting essentially of Ginkgolide A and Ginkgolide J.

19. (Currently Amended): A composition consisting essentially of (i) an antioxidant, a pharmaceutical carrier, or a combination thereof and (ii) two or more structurally distinct compounds, each having the formula:



(II)

wherein:

each occurrence of Y is independently $-\text{CH}_2-$ or $-\text{C}(\text{O})-$;

R^1 and R^3 are each independently $-\text{H}$ or $-\text{C}_1\text{-C}_6$ alkyl;

R^1 and R^3 are each independently $-\text{H}$ or $-\text{C}_1\text{-C}_6$ alkyl;

R^2 is $-\text{H}$, $-\text{OH}$, $-\text{O-C}_1\text{-C}_5$ alkyl, $-\text{O-C}_2\text{-C}_5$ alkenyl, $-\text{O-C}_2\text{-C}_5$ alkynyl, $-\text{O-C}(\text{O})\text{-C}_1\text{-C}_5$ alkyl, $-\text{O-C}(\text{O})\text{-aryl}$, $-\text{O-CO-NH-C}_1\text{-C}_5$ alkyl, $-\text{O-SO}_2\text{-C}_1\text{-C}_5$ alkyl, or $-\text{O-SO}_2\text{-aryl}$;

R^4 is $-\text{C}_1\text{-C}_5$ alkyl, $-\text{NH}_2$, $-\text{halo}$, $-\text{C}_2\text{-C}_5$ alkenyl, $-\text{C}_2\text{-C}_5$ alkynyl, $-\text{O-C}_1\text{-C}_5$ alkyl, $-\text{O-C}_2\text{-C}_5$ alkenyl, $-\text{O-C}_2\text{-C}_5$ alkynyl, $-\text{O-C}(\text{O})\text{-C}_1\text{-C}_5$ alkyl, $-\text{O-C}(\text{O})\text{-aryl}$, $-\text{O-CO-NH-C}_1\text{-C}_5$ alkyl, $-\text{O-SO}_2\text{-C}_1\text{-C}_5$ alkyl, or $-\text{O-SO}_2\text{-aryl}$; and

R^5 is $-\text{H}$ or $-\text{OH}$.

20. (Original): The composition of claim 19, wherein the antioxidant is vitamin C, vitamin E, N-acetyl-L-cysteine, resveratrol, coenzyme Q, alpha-lipoic acid, lycopene, or any combination thereof.

21. (Previously Presented): The composition of claim 19, wherein the antioxidant is a biflavone.

22. (Original): The composition of claim 21, wherein the biflavone is amentoflavone, ailobetin, ginkgetin, isoginkgetin, sciadopirysin, or any combination thereof.

23. (Previously Presented): The composition of claim 19, wherein the antioxidant is a flavonoid.

24. (Original): The composition of claim 23, wherein the flavonoid is a flavonol glycoside.

25. (Original): The composition of claim 24, wherein the flavonol glycoside is quercetin, kaempferol, isorhamnetin, or any combination thereof.

26-28. (Canceled).

29. (Currently Amended): ~~[[A]] The composition of claim 18, consisting essentially of ginkgolide A and ginkgolide J,~~ wherein the composition is obtained using a process comprising:

(i) extracting Ginkgo Biloba plant material with ethyl acetate and filtering the resultant solution to provide a first filtered residue and a first filtrate;

(ii) diluting the first filtered residue with diethyl ether and filtering the resultant solution to provide a second filtered residue and a second filtrate;

(iii) diluting the second filtered residue with methanol and filtering the resultant solution to provide a third residue and a third filtrate;

(iv) concentrating the third filtrate and subjecting the resultant concentrate to chromatography under conditions sufficient to provide a first fraction which comprises a mixture of Ginkgolide A and Ginkgolide B, and a second fraction which comprises a mixture of Ginkgolide C and Ginkgolide J;

(v) combining the first and second fractions and concentrating the combined first and second fractions to provide a concentrate which comprises Ginkgolide A, Ginkgolide B, Ginkgolide C and Ginkgolide J;

(vi) diluting the concentrate obtained in step (v) with an organic solvent and contacting the components of the resultant solution with benzyl bromide in the presence of a non-nucleophilic base under conditions sufficient to provide a product mixture which comprises unreacted Ginkgolide A, unreacted Ginkgolide J, benzylated Ginkgolide B and benzylated Ginkgolide C;

(vii) subjecting the product mixture obtained in step (vii) to chromatography under conditions sufficient to provide a composition comprising Ginkgolide A and Ginkgolide J; and

(viii) purifying the composition obtained in step (vii) to obtain a purified composition consisting essentially of Ginkgolide A and Ginkgolide J.

30. (Currently Amended): An extract comprising more than 10% terpene trilactones, wherein the proportion of terpene trilactones, by weight of the total amount of terpene trilactones, is

from about 20% to about 30% or about 52% to about 62% bilobalide,

from about 10% to about 20% or about 37% to about 47% ginkgolide A,

from about 5% to about ~~15%~~ 20% ginkgolide B,

from about 5% to about ~~15%~~ 20% ginkgolide C, and

from about 1 % to about 8% ginkgolide J, and

wherein the percentages of bilobalide, ginkgolide A, ginkgolide B, ginkgolide C and ginkgolide J add up to 100%.

31. (Canceled).

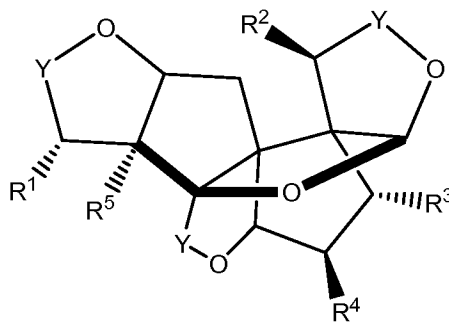
32. (Currently Amended): The extract of claim 30 ~~or 31~~, comprising about 65% terpene trilactones.

33. (Currently Amended): The extract of claim 30 ~~or 31~~, comprising about 70% terpene trilactones.

34. (Currently Amended): A method of treating a ~~neurological or neurodegenerative~~ disease or disorder comprising administering to a subject an effective amount of

(i) an enriched *Ginkgo biloba* extract comprising at least about 60% terpene trilactones; or

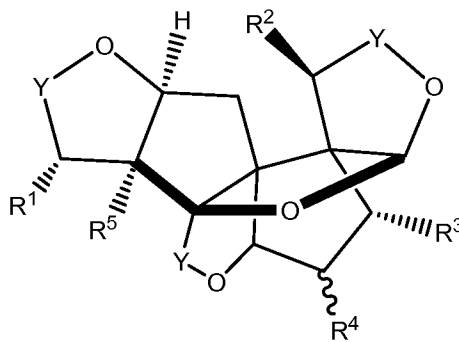
(ii) a compound having the formula:



(I)

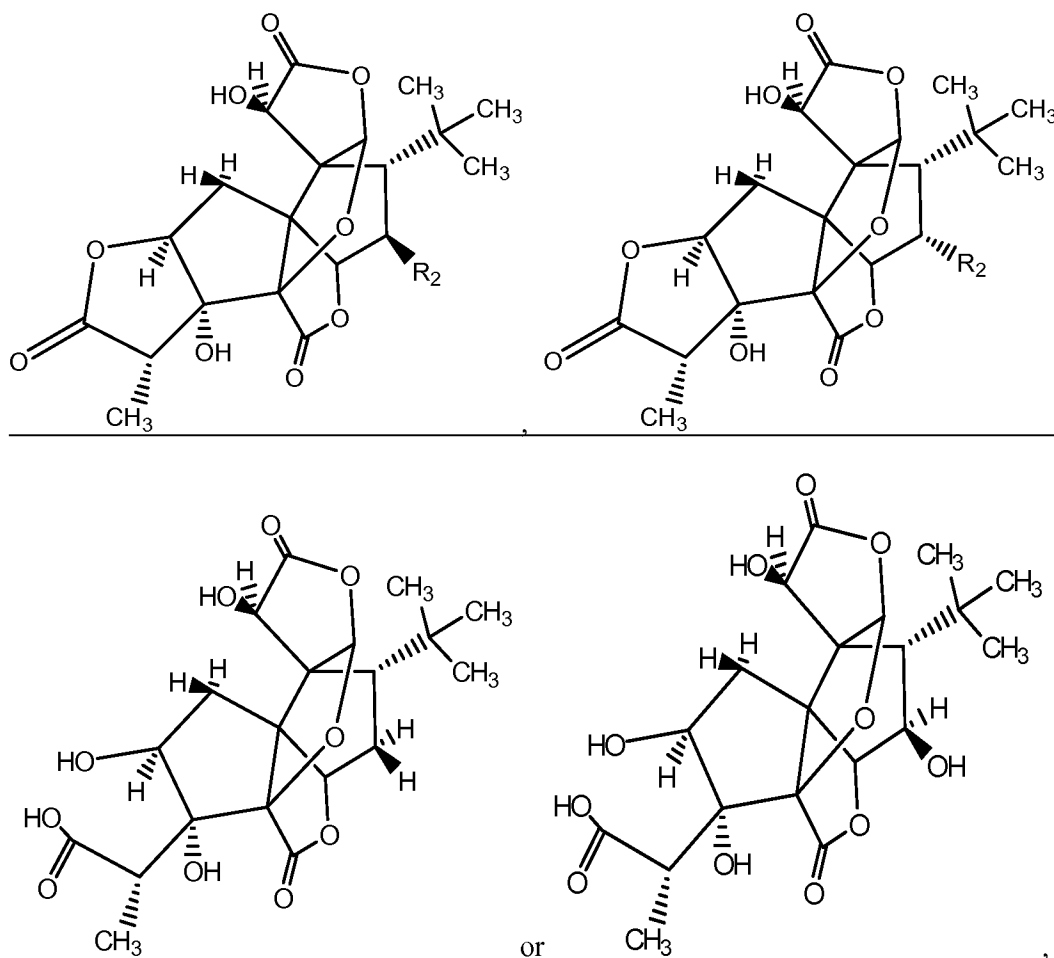
or a pharmaceutically acceptable salt thereof; or

(iii) a composition consisting essentially of two or more structurally distinct compounds, each having the formula:



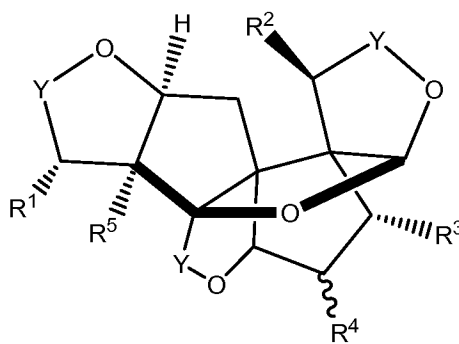
(II); or

(iv) a composition consisting essentially of a first compound having the formula:



wherein R_2 is $-H$, $-C_1-C_5$ alkyl, $-OH$, $-NH_2$, $-halo$, $-C_2-C_5$ alkenyl, $-C_2-C_5$ alkynyl, $-O-C_1-C_5$ alkyl, $-O-C_2-C_5$ alkenyl, $-O-C_2-C_5$ alkynyl, $-O-C(O)-C_1-C_5$ alkyl, $-O-C(O)-aryl$, $-O-CO-NH-C_1-C_5$ alkyl, $-O-SO_2-C_1-C_5$ alkyl, or $-O-SO_2-aryl$;

and one or more structurally distinct compounds, each having the formula:



(II); or

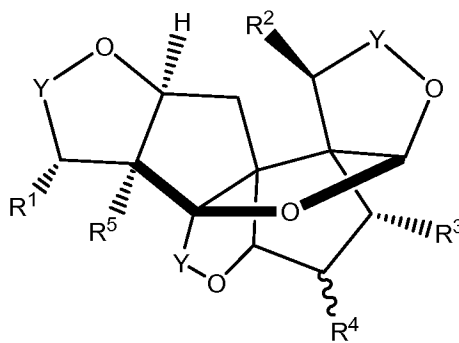
(v) a composition consisting essentially of Ginkgolide A, Ginkgolide J, or combinations thereof;

or

(vi) a composition consisting essentially of (a) an antioxidant, a pharmaceutical carrier, or a

combination thereof and (b) two or more structurally distinct compounds, each having the

formula:



(II)

wherein in formula (II):

each occurrence of Y is independently -CH₂- or -C(O)-;

R¹ and R³ and are each independently -H or -C₁-C₆ alkyl;

R¹ and R³ are each independently -H or -C₁-C₆ alkyl;

R² is -H, -OH, -O-C₁-C₅ alkyl, -O-C₂-C₅ alkenyl, -O-C₂-C₅ alkynyl, -O-C(O)-C₁-C₅ alkyl, -O-C(O)-aryl, -O-CO-NH-C₁-C₅ alkyl, -O-SO₂-C₁-C₅ alkyl, or -O-SO₂-aryl;

R⁴ is -C₁-C₅ alkyl, -NH₂, -halo, -C₂-C₅ alkenyl, -C₂-C₅ alkynyl, -O-C₁-C₅ alkyl, -O-C₂-C₅ alkenyl, -O-C₂-C₅ alkynyl, -O-C(O)-C₁-C₅ alkyl, -O-C(O)-aryl, -O-CO-NH-C₁-C₅ alkyl, -O-SO₂-C₁-C₅ alkyl, or -O-SO₂-aryl; and

R⁵ is -H or -OH.

~~the compound of claim 1, or the composition of claim 2, 12, 13, 16, 17, 19, 26, or 27, or the extract of claim 30 or 31.~~

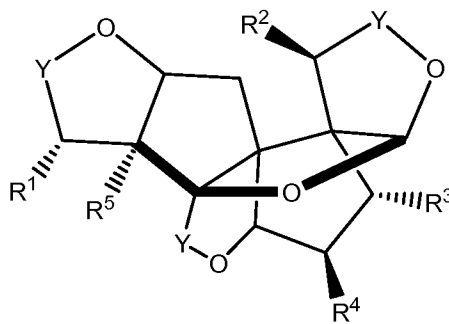
35. (Currently Amended): The method of claim 34, wherein the disease or the disorder is a neurological or neurodegenerative disease or disorder, a memory disorder, depression, neurological damage, Alzheimer's diseases, multiple sclerosis, amyotrophic lateral sclerosis, Alpers' disease, corticobasal ganglionic degeneration, multiple system atrophy, motor neuron disease, olivopontocerebellar atrophy, Parkinson's disease, prion disease, Rett syndrome, tuberous sclerosis, Shy-Drager syndrome, Huntington's disease, senile dementia, epileptic dementia, presenile dementia, post-traumatic dementia, vascular dementia and post stroke dementia, alcoholism, meningitis, neonatal hypoxia, stroke, global cerebral ischemia, or any combination thereof. ~~is Alzheimer's disease.~~

36-39. (Canceled).

40. (Currently Amended): A method for protecting a neuron against neuronal cell death or long term potentiation impairment by beta amyloid protein comprising contacting the neuron with

(i) an enriched *Ginkgo biloba* extract comprising at least about 60% terpene trilactones; or

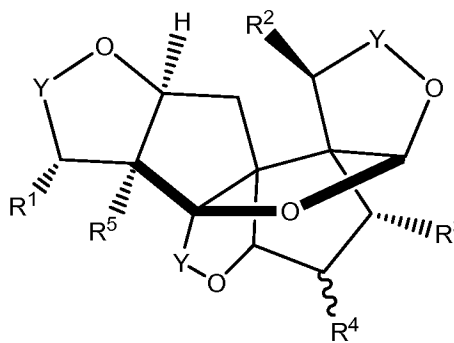
(ii) a compound having the formula:



(I)

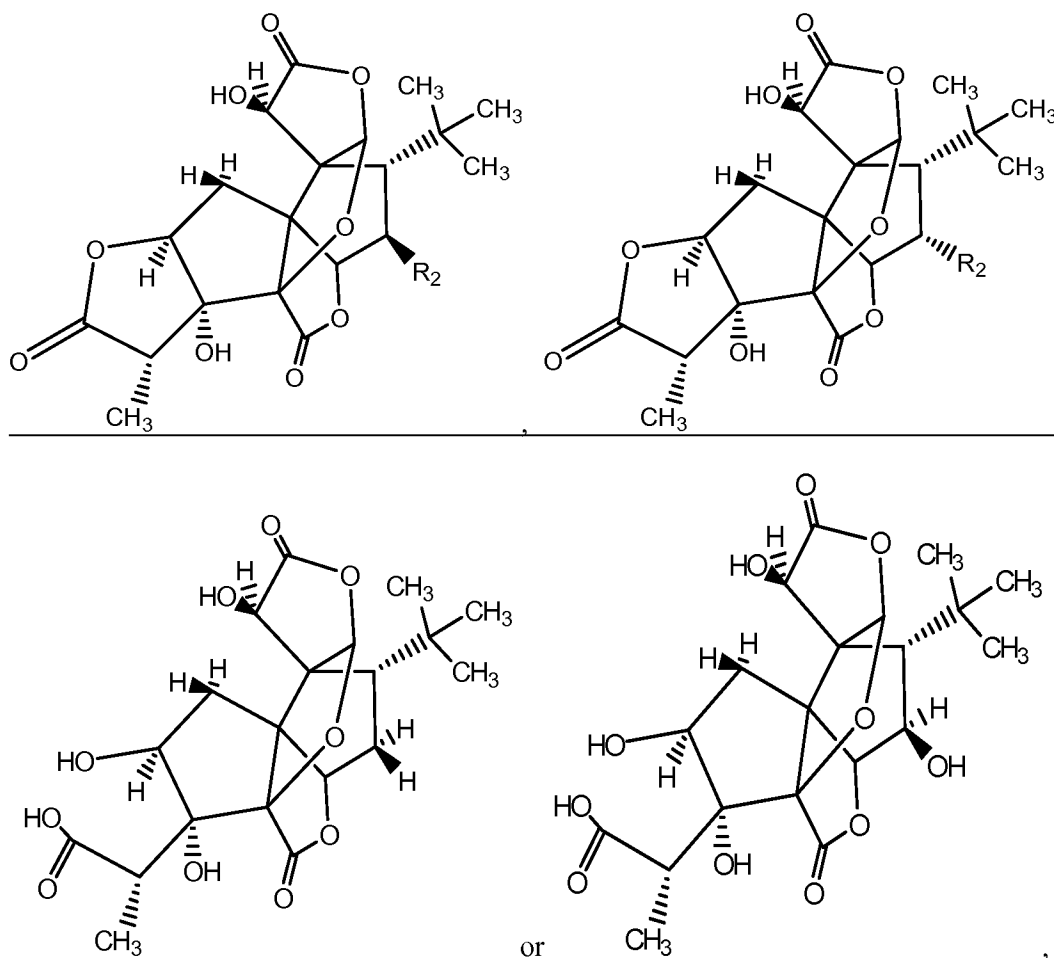
or a pharmaceutically acceptable salt thereof; or

(iii) a composition consisting essentially of two or more structurally distinct compounds, each having the formula:



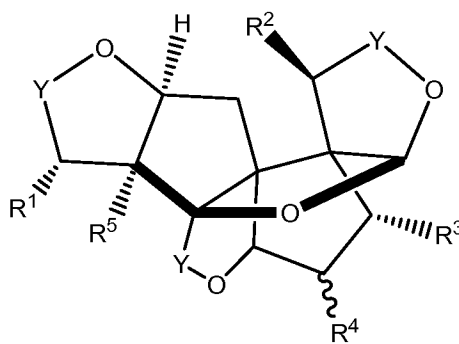
(II); or

(iv) a composition consisting essentially of a first compound having the formula:



wherein R_2 is $-H$, $-C_1-C_5$ alkyl, $-OH$, $-NH_2$, $-halo$, $-C_2-C_5$ alkenyl, $-C_2-C_5$ alkynyl, $-O-C_1-C_5$ alkyl, $-O-C_2-C_5$ alkenyl, $-O-C_2-C_5$ alkynyl, $-O-C(O)-C_1-C_5$ alkyl, $-O-C(O)-aryl$, $-O-CO-NH-C_1-C_5$ alkyl, $-O-SO_2-C_1-C_5$ alkyl, or $-O-SO_2-aryl$;

and one or more structurally distinct compounds, each having the formula:



(II); or

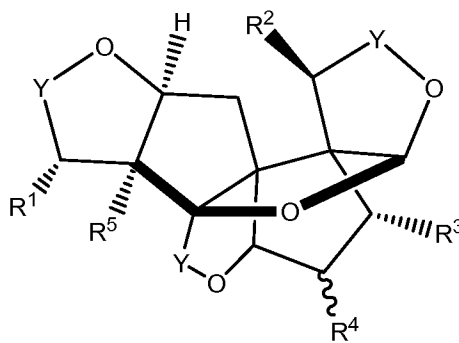
(v) a composition consisting essentially of Ginkgolide A, Ginkgolide J, or combinations thereof;

or

(vi) a composition consisting essentially of (a) an antioxidant, a pharmaceutical carrier, or a

combination thereof and (b) two or more structurally distinct compounds, each having the

formula:



(II)

wherein in formula (II):

each occurrence of Y is independently –CH₂– or –C(O)–;

R¹ and R³ and are each independently –H or –C₁–C₆ alkyl;

R¹ and R³ are each independently –H or –C₁–C₆ alkyl;

R² is -H, -OH, -O-C₁-C₅ alkyl, -O-C₂-C₅ alkenyl, -O-C₂-C₅ alkynyl, -O-C(O)-C₁-C₅ alkyl, -O-C(O)-aryl, -O-CO-NH-C₁-C₅ alkyl, -O-SO₂-C₁-C₅ alkyl, or -O-SO₂-aryl;

R⁴ is -C₁-C₅ alkyl, -NH₂, -halo, -C₂-C₅ alkenyl, -C₂-C₅ alkynyl, -O-C₁-C₅ alkyl, -O-C₂-C₅ alkenyl, -O-C₂-C₅ alkynyl, -O-C(O)-C₁-C₅ alkyl, -O-C(O)-aryl, -O-CO-NH-C₁-C₅ alkyl, -O-SO₂-C₁-C₅ alkyl, or -O-SO₂-aryl; and

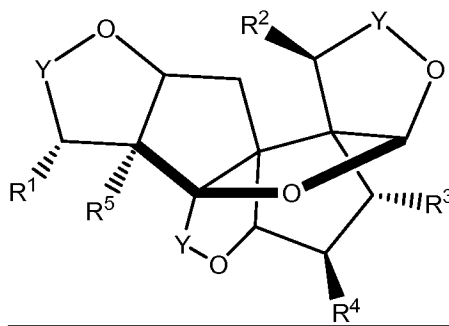
R⁵ is -H or -OH.

~~the compound of claim 1, or the composition of claim 2, 12, 13, 16, 17, 19, 26, or 27, or the extract of claim 30 or 31.~~

41. (Currently Amended): A method for stimulating axonal out growth of a neuron comprising contacting the neuron with

(i) an enriched *Ginkgo biloba* extract comprising at least about 60% terpene trilactones; or

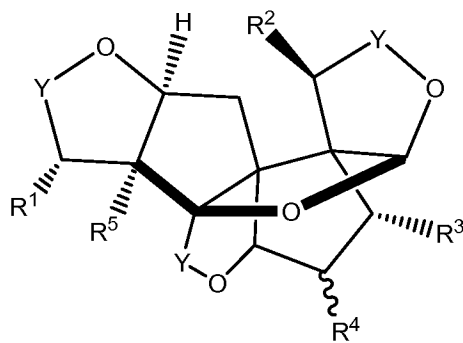
(ii) a compound having the formula:



(I)

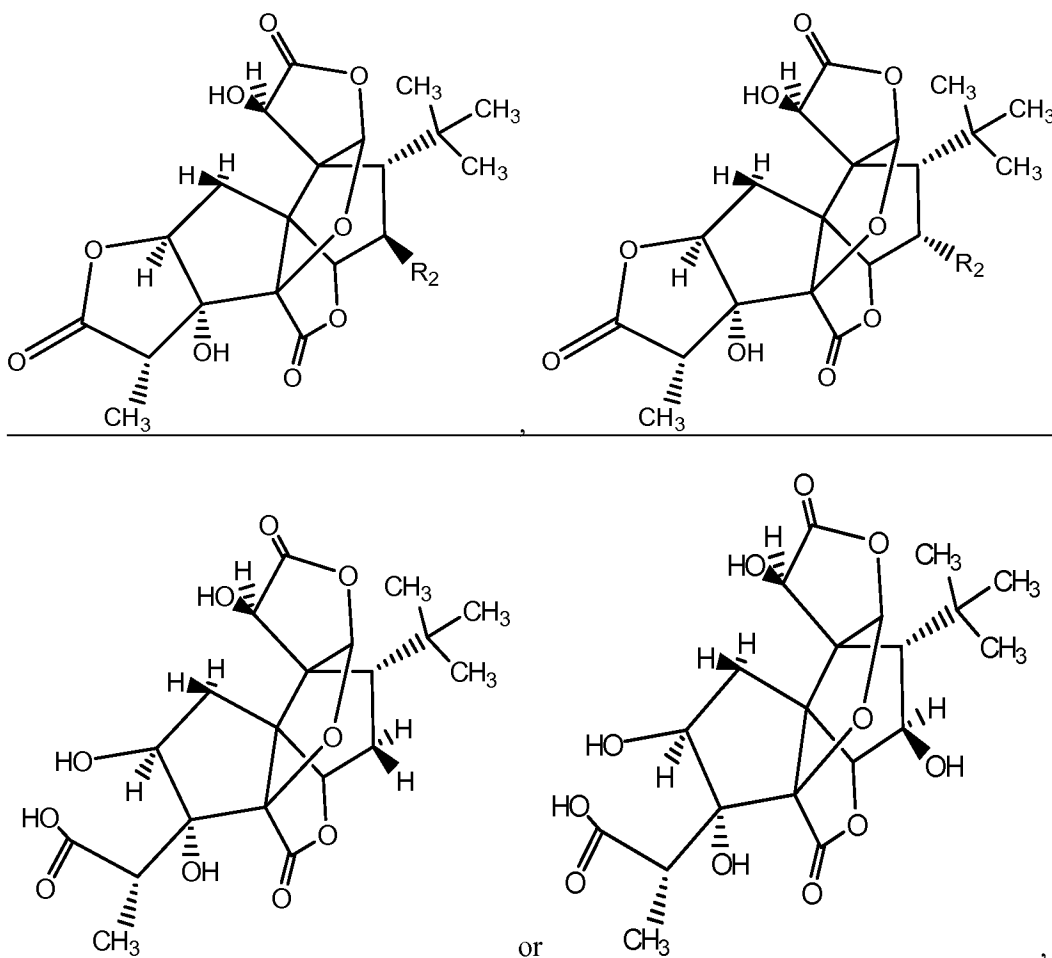
or a pharmaceutically acceptable salt thereof; or

(iii) a composition consisting essentially of two or more structurally distinct compounds, each having the formula:



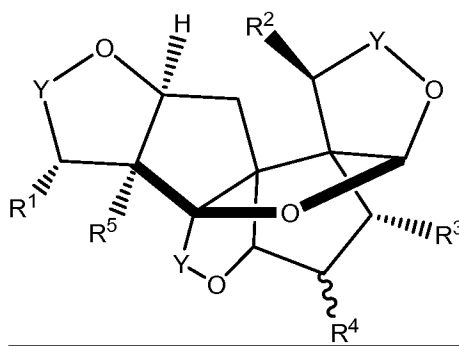
(II); or

(iv) a composition consisting essentially of a first compound having the formula:



wherein R₂ is -H, -C₁-C₅ alkyl, -OH, -NH₂, -halo, -C₂-C₅ alkenyl, -C₂-C₅ alkynyl, -O-C₁-C₅ alkyl, -O-C₂-C₅ alkenyl, -O-C₂-C₅ alkynyl, -O-C(O)-C₁-C₅ alkyl, -O-C(O)-aryl, -O-CO-NH-C₁-C₅ alkyl, -O-SO₂-C₁-C₅ alkyl, or -O-SO₂-aryl;

and one or more structurally distinct compounds, each having the formula:



(II); or

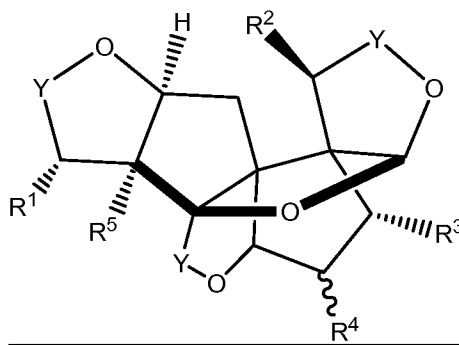
(v) a composition consisting essentially of Ginkgolide A, Ginkgolide J, or combinations thereof;

or

(vi) a composition consisting essentially of (a) an antioxidant, a pharmaceutical carrier, or a

combination thereof and (b) two or more structurally distinct compounds, each having the

formula:



(II)

wherein in formula (II):

each occurrence of Y is independently -CH₂- or -C(O)-;

R¹ and R³ are each independently -H or -C₁-C₆ alkyl;

R¹ and R³ are each independently -H or -C₁-C₆ alkyl;

R² is -H, -OH, -O-C₁-C₅ alkyl, -O-C₂-C₅ alkenyl, -O-C₂-C₅ alkynyl, -O-C(O)-C₁-C₅ alkyl, -O-C(O)-aryl, -O-CO-NH-C₁-C₅ alkyl, -O-SO₂-C₁-C₅ alkyl, or -O-SO₂-aryl;

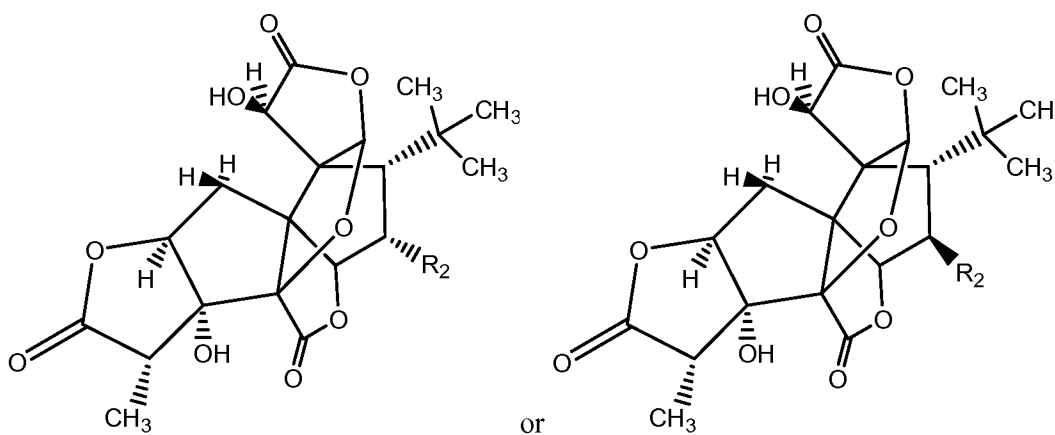
R⁴ is -C₁-C₅ alkyl, -NH₂, -halo, -C₂-C₅ alkenyl, -C₂-C₅ alkynyl, -O-C₁-C₅ alkyl, -O-C₂-C₅ alkenyl, -O-C₂-C₅ alkynyl, -O-C(O)-C₁-C₅ alkyl, -O-C(O)-aryl, -O-CO-NH-C₁-C₅ alkyl, -O-SO₂-C₁-C₅ alkyl, or -O-SO₂-aryl; and

R⁵ is -H or -OH.

~~the compound of claim 1, or the composition of claim 2, 12, 13, 16, 17, 19, 26, or 27, or the extract of claim 30 or 31.~~

42-43. (Canceled).

44. (Currently Amended): A method of identifying a receptor that binds a compound that protects against neuronal cell death or long term potentiation impairment by beta amyloid protein comprising administering the phosphodiesterase inhibitor to a subject a compound having the formula:



wherein R₂ is a detectable moiety.

45. (Canceled).

46. (Currently Amended): The method of claim 44 ~~or 45~~, wherein the detectable moiety comprises a photoactivatable moiety, a fluorescent moiety, or a radioactive moiety.

47-57. (Canceled).